ADAPTED CORN HYBRIDS ARE MORE DEPENDABLE

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Selected standard 75 to 105 relative maturity (RM) open pedigree corn hybrids and new hybrids are tested annually for grain and silage yields in agronomy plots at Fargo. Data in Tables 1, 2 and 3 are limited to 12 years. Many of these standard relative maturity (RM) hybrids have been in production in this period.

Corn Grown for Grain Must Mature

Table 1 shows that late maturing 100 and 105 RM hybrids matured satisfactorily to ear moisture percentages lower than 40 per cent at harvest in warm (high degree days) or long growing season years. In cool (low degree days) or short growing seasons, the ear moisture of harvested corn was too high (40 per cent or higher) for good quality grain (see underlined moisture per cent in Tables 1 and 2). These late maturing 100-105 RM hybrids produced high grain yields in very favorable growing seasons. But in cool or otherwise unfavorable seasons their yields were low and the corn was immature and unsafe for storage without artificial drying.

Earlier maturing hybrids (75 to 94 RM) matured satisfactorily in average seasons. In unfavorable seasons, these early maturing hybrids

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Table 1. Annual and 12 year average corn grain yield[1]/ and ear moisture percentage[2]/ of six standard open pedigree hybrids at Fargo.

Year	AES 101 75 RM		Nodak 306 83 RM		Nodak 307 84 RM		Nodak 502 94 RM		Minn. 608 100 RM		105 RM[3]/		Degree[4]/ days
	bu/A	Moist%	bu/A	Moist%	bu/A	Moist%	bu/A	Moist%	bu/A	Moist%	bu/A	Moist%	
1955	54.0	21.4	63.5	26.8	63.7	29.7	67.2	31.5	64.5	37.1	65.2	38.9	2272
1956	53.2	13.2	62.4	14.1	67.7	19.1	69.3	20.0	65.1	22.5	58.2	22.6	1944
1957	65.7	21.9	67.0	24.2	73.1	25.0	70.3	28.9	71.0	33.4	62.6	50.2[4]/	2032
1958	58.0	25.1	61.1	30.5	64.0	33.3	71.8	33.8	71.4	36.8	66.2	51.8[5]/	1744
1959	61.0	19.9	64.4	24.0	65.8	25.0	72.0	27.1	61.4	31.1	58.5	36.7	2238
1960	60.4	21.5	67.2	28.3	69.5	30.5	68.6	30.9	69.0	37.7	74.2	40.6[6]/	2109
1961	59.8	21.2	67.3	27.1	67.7	29.8	68.4	33.7	77.5	36.1	74.4	43.5[6]/	2319
1962[5]	17.9	37.8	21.5	38.0	17.8	41.2[6]/	18.2	50.7[6]/	18.7	58.9[6]/	19.6	53.2[6]/	2013
1963	64.3	17.2	70.9	21.6	72.9	22.4	79.9	27.5	88.4	28.4	93.6	32.5	2227
1964	57.8	13.7	59.1	17.8	58.8	17.8	59.0	23.1	58.7	24.9	52.1	28.6	1986
1965	69.1	33.5	70.2	35.7	73.9	35.0	77.4	36.8	76.1	41.6[6]/	68.9	50.2[6]/	1596
1966	71.0	19.7	74.9	23.7	77.9	24.0	79.8	28.7	80.0	28.5	78.2	35.1	2029
12 year averages													
Bu.	57.7		62.4		64.4		66.8		66.8		64.3		
Moist%		22.2		26.0		27.7		31.1		34.8		40.0	

[1]/ Yield at 15 per cent moisture.
[2]/ Ear moisture per cent at harvest.
[3]/ 105 RM: 1955-62, MS250; 1963-66, Minn. 519.
[4]/ Cumulative degree days. (mean daily temperature - 50 degrees F, May 20 to Sept. 15)
[5]/ Excessive rain delayed planting and damaged corn.
[6]/ Underlined indicates ear moisture too high, i.e., immature corn.

Table 2. Annual and 4-year average ear moisture and corn grain yield of 6 standard and 6 experimental hybrids at Fargo.

Hybrids in order of maturity	RM	Ear moisture at harvest					Bushels of grain corn/acre				
		1963	'64	'65	'66	Avg.	1963	'64	'65	'66	Avg.
Hybrid AES101	75	17.2	13.7	33.5	19.7	21.0	64.3	57.8	69.1	71.0	65.6
Nodakhybrid 306	83	21.6	17.8	35.7	23.7	24.7	70.9	59.1	70.2	74.9	68.8
Nodakhybrid 307	84	22.4	17.8	35.0	24.0	24.8	72.9	58.8	73.9	77.9	70.9
Exptl. SX B564[1]/	86	23.4	19.4	37.1	26.9	26.7	84.6	62.0	84.2	88.9	79.9
Nodakhybrid 502	94	27.5	23.1	36.8	28.7	29.0	79.9	59.0	77.4	79.8	74.0
Exptl. DX ND45[1]/	94	28.5	24.1	38.6	25.9	29.3	77.8	61.6	76.3	78.0	73.4
Exptl. DX ND 87[1]/	95	26.0	25.9	39.6	26.7	29.6	88.1	58.1	77.7	77.1	75.3
Exptl. SX E399[1]/	95	27.8	24.1	38.3	28.3	29.6	86.6	58.9	75.0	80.6	75.3
Exptl. DX ND95[1]/	100	28.9	22.5	41.2	29.6	30.6	87.5	61.6	78.8	81.6	77.4
Minhybrid 608	100	28.4	24.9	41.6	28.5	30.9	88.4	58.7	76.1	80.0	75.8
Exptl. DX ND113[1]/	103	33.8	28.4	47.0	34.9	36.0	89.6	58.4	77.6	74.9	75.1
Minn 519	105	32.9	28.6	50.2	35.1	36.7	93.6	52.1	68.9	78.2	73.2
Degree days		2227	1986	1596	2027						

[1]/ Experimental - double and single cross seed is not yet in commercial production.

attained fair maturity and yielded higher than the 100 and 105 RM hybrids.

The 12-year averages for ear moisture percentages and grain yields showed that 84 RM hybrids produced grain yields as high as the 105 RM and the ear moisture percentage of 27.7 per cent was low enough for safe ear corn storage. This satisfactory maturity and about equal average yield assured good quality grain corn. Other intermediate (94 and 100 RM) hybrids produced higher average yields, but their average ear moisture gradually increased with lateness of the hybrid.

Performance of six experimental hybrids and the six standard RM hybrids is compared in Table 2. In the two unusually favorable corn growing seasons of 1963 and 1966, all corn matured satisfactorily and the late (100-105 RM) hybrids produced high grain yields. However, in the cool and short growing seasons of 1964 and 1965 these 100-105 RM hybrids yielded about average, but corn grain was very immature in 1965.

New, midseason (86 to 94 RM and 95 to 100 RM) hybrids produced highest average grain yields but their average ear moisture was progressively higher, especially in 1965, than 75 to 84 RM hybrids. The experimental single cross B564 excelled all named and experimental hybrids in the 75 to 105 RM range for grain yield during the 1963-66 period (Table 2).

Adapted corn hybrids are most dependable for grain corn production in any corn maturity zone of North Dakota. The early adapted corn hybrids offer insurance against the occurrence of high ear moisture, immature and poor quality corn grain.

Moisture and Grain Contribute to Silage Quality

Corn silage yields and the percentage of ears in the silage are shown in Table 3. High silage

Table 3. Annual and 4- and 12-year average silage yield, and per cent and tons of ears in silage at Fargo.

Hybrids in order of maturity	RM	Tons of silage/acre						Ears in silage, per cent					Tons Ears[1]/
		1963	'64	'65	'66	Avg. 4 yr	Avg. 12 yr	1963	'64	'65	'66	Avg. 4 yr	Avg. 4 yr
Hybrid AES101	75	10.9	10.0	12.8	11.5	11.3	9.8	59.9	53.8	51.7	49.9	53.8	6.1
Nodakhybrid 306	83	12.8	10.5	13.7	13.3	12.6	10.6	52.3	52.8	44.4	43.4	48.3	6.1
Nodakhybrid 307	84	12.4	10.7	14.8	13.2	12.8	11.2	57.8	52.1	52.7	46.2	52.2	6.7
Exptl. SX B564	86	13.1	10.3	14.7	13.3	12.9	—	62.7	55.1	49.8	47.1	53.7	6.9
Nodakhybrid 502	94	12.7	10.7	15.1	13.8	13.1	11.4	58.6	51.7	45.7	50.0	51.5	6.8
Exptl. DX ND45	94	13.4	11.8	14.4	14.1	13.4	—	53.6	44.2	43.5	49.1	47.6	6.4
Exptl. DX 87	95	13.5	10.9	14.5	13.8	13.2	—	56.2	47.1	44.6	48.6	49.1	6.5
Exptl. SX B399	95	15.0	10.8	14.8	14.2	13.7	—	49.8	39.7	43.5	42.6	43.9	6.0
Exptl. DX ND95	100	13.9	10.9	15.1	13.7	13.4	—	52.5	45.9	42.3	50.1	47.7	6.4
Minhybrid 608	100	15.2	11.2	15.4	14.1	14.0	12.1	50.4	39.8	40.2	47.2	44.4	6.2
Exptl. DX ND113	103	14.0	10.7	15.2	13.5	13.4	—	54.7	41.7	42.1	49.8	47.1	6.3
Minn. 519[2]	105	15.3	10.6	16.1	14.6	14.2	12.3	47.0	33.2	33.6	42.7	39.1	5.6

[1]/ Tons of ears in total silage.
[2]/ 105 RM: 1955-62, MS250; 1963-1966 Minn. 519.

yields usually are associated with normal or above normal rainfall. Silage quality is measured by the amount of moisture and the proportion of ear corn in the silage at harvest. High quality silage is produced when the corn is cut at 65-70 per cent moisture and contains all available green leaves and a high percentage of ears or grain. Early maturing hybrids contain 65 to 70 per cent moisture in early September and can be ensiled before the fall frost. However, the higher moisture content of late maturing corn may delay ensiling until after the fall frost and result in partial loss of nutritive green leaves.

Corn planted for silage production, where full grain maturity is not required, may be about five days later in maturity than that grown for mature grain production. The four- and 12-year averages showed that silage yields are progressively higher with later maturing hybrids. Yields were 13.1 and 11.4 tons in the four- and 12-year averages for 94 RM Nodakhybrid 502; and 14.2 and 12.3 tons for the four- and 12-year average, for 105 RM hybrid. The four-year average percentage of ears in silage ranged from 51.5 per cent in 94 RM to 39.1 per cent in 105 RM hybrid. The 94 RM hybrid produced 6.8 tons of ears in 13.1 tons total silage while the 105 RM hybrid produced 5.6 tons ears in 14.2 tons total silage. This greater amount (1.2 tons) of ears in silage of the 94 RM hybrid may increase the nutritive value to offset the 1.1 tons lower total silage yield. These differences of ears in total silage are less when the 95 to 100 RM hybrids are compared with 105 RM hybrid.

These data showed the performance of standard RM hybrids in the 85 to 92 RM zone at Fargo. Later maturing, 94 RM hybrids serve as standards for grain production in the Southeastern 92 to 102 RM zone. In the Northwestern 83 to 85 RM zone, the 83 and 84 RM hybrids serve as maturity standards. In the West Central and Western areas, 80 to 83 RM and 75 and 83 RM hybrids, respectively, should be used as maturity standards. (See 1965 and 1966 Hybrid Corn Performance Trials, Agron. Mimeo Cir. 100 and 101.)

Figure 1. Corn Maturity Zones of North Dakota. The maturity zones indicate where a corn variety of a given relative maturity has matured satisfactorily in the average seasons.